A case of ketoacidosis

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ALGERIA
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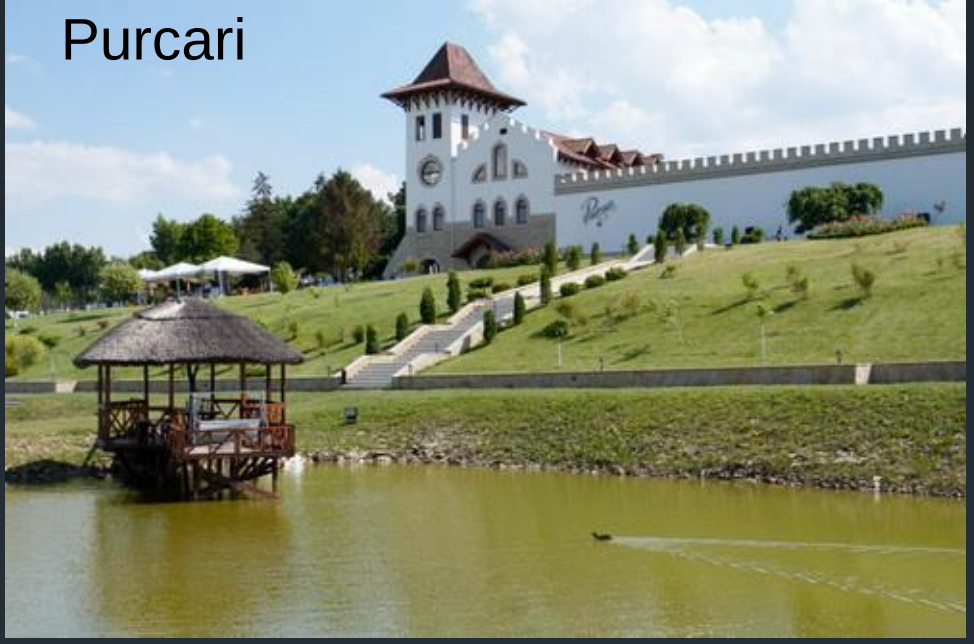
300 Kilometers
300 Miles



Cricova: The Largest Underground Wine Cellar in the World (2012)

Mileștii Mici - underground wine city with the biggest wine collection in the world , nearly 2 million bottles. [Guinness Book, 2005]. The total length of underground streets is 200 km may be passed by transport.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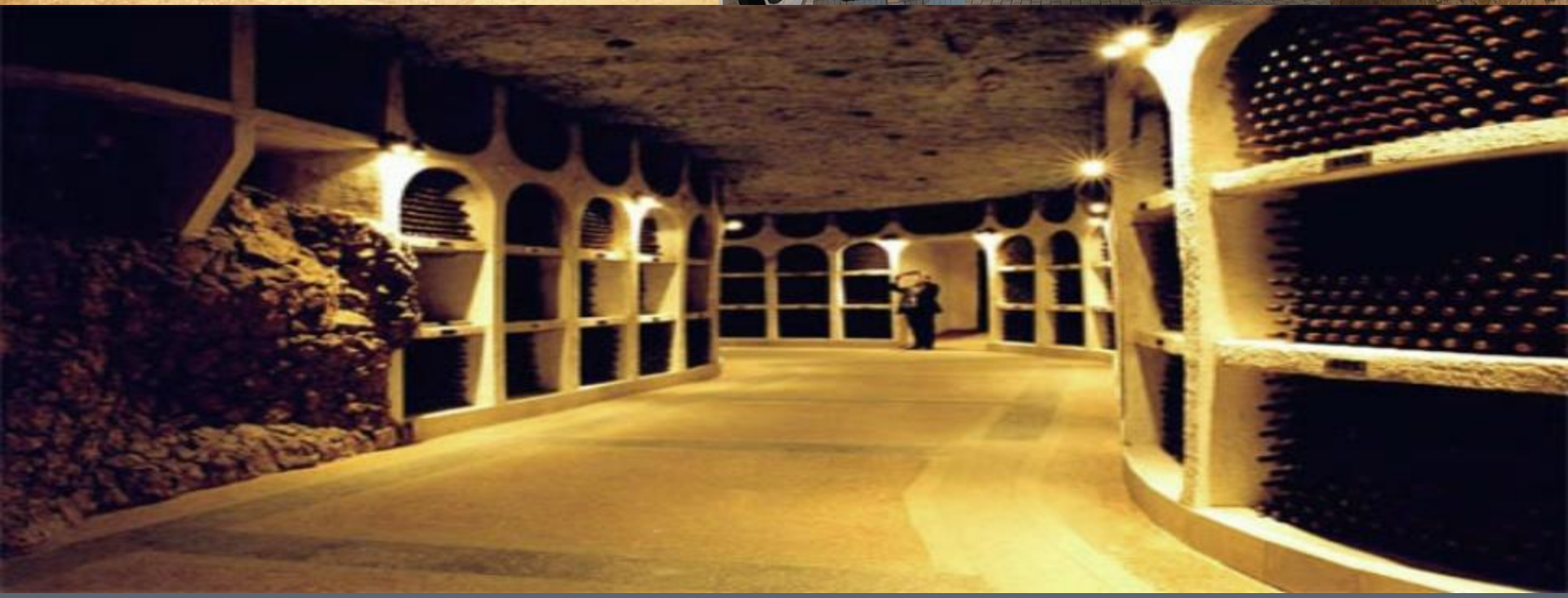


- VA, a 45-year-old man, presented, in poor but stable general condition, to the emergency room.

- Complaints:

nausea, vomiting, thirst, polyuria, moderate abdominal pain and fatigue.

- History:

✓Diabetes type 1 (DM1) - 12 years

✓High BP (145/80- 150/85mmHg) – no treatment

✓No other documented illness or exposure to medicines in the last year.

- Clin exam: BP 115/75 mmHg, PR 82, he was dehydrated, BT 36,9°C
- Lab exam: glucose 14mmol, WBC 10.8×10^9/l; urine leukocytes – 5-7; urine ketones -positive;

- His complaints date from about a week.

- The reason for hospitalization was the poor control of diabetes, ketoacidosis.

Endocrine Department

Treatment for ketoacidosis

(insulin, continuous intravenous and oral fluid replacement)

Other investigations and monitoring

After 6 hours - first results:

- **No improvements in general condition**
- **He added that had 1-2 unformed (loose) stools per day for at least 3-4 days**
- **body temperature 37,2°C**
- **Lab exam: glucose 9 mmol, HbA1C 6,9%, WBC 12.0×10^9/l; urea 11,3 mmol/L (2.5-6.7); creatinine 1,4 mg/dL (normal range 0,7-1,3), urine leukocytes – 2-3, microalbuminuria.**
- **pH 7,32; no other significat acido-base disorders;**
- **Albumins, Proteins, liver tests, CrCl, K, Na - normal.**
- **EKG, chest X-ray – No changes.**
- **Abdomen ultrasound exam – hepatomegaly, steatosis.**
- **Viral Hepatitis Markers - negative**
- **Gastroscopy – gastritis**

- **Blood & urine culture were requested**

- During the following days white blood cell count and body temperature increased.

Day	WBC	BT	Glucose
1 morning	12	37,2	9,0
1 evening	13,2	38,0	7,4
2 morning	14,4	38,4	6,0
2 evening	15,7	38,6	7,1

- Plain X rays, Colonoscopy, Irrigoscopy – no changes

- Because the symptoms did not improve and his general condition started to deteriorate – empiric antibiotic therapy was started (Ciprofloxacin).

Day	WBC	BT
3 morning	15,8	38,2
3 evening	16,1	38,6
4 morning	18,4	39,0
4 evening	19,0	39,5
5	19,2	39,2

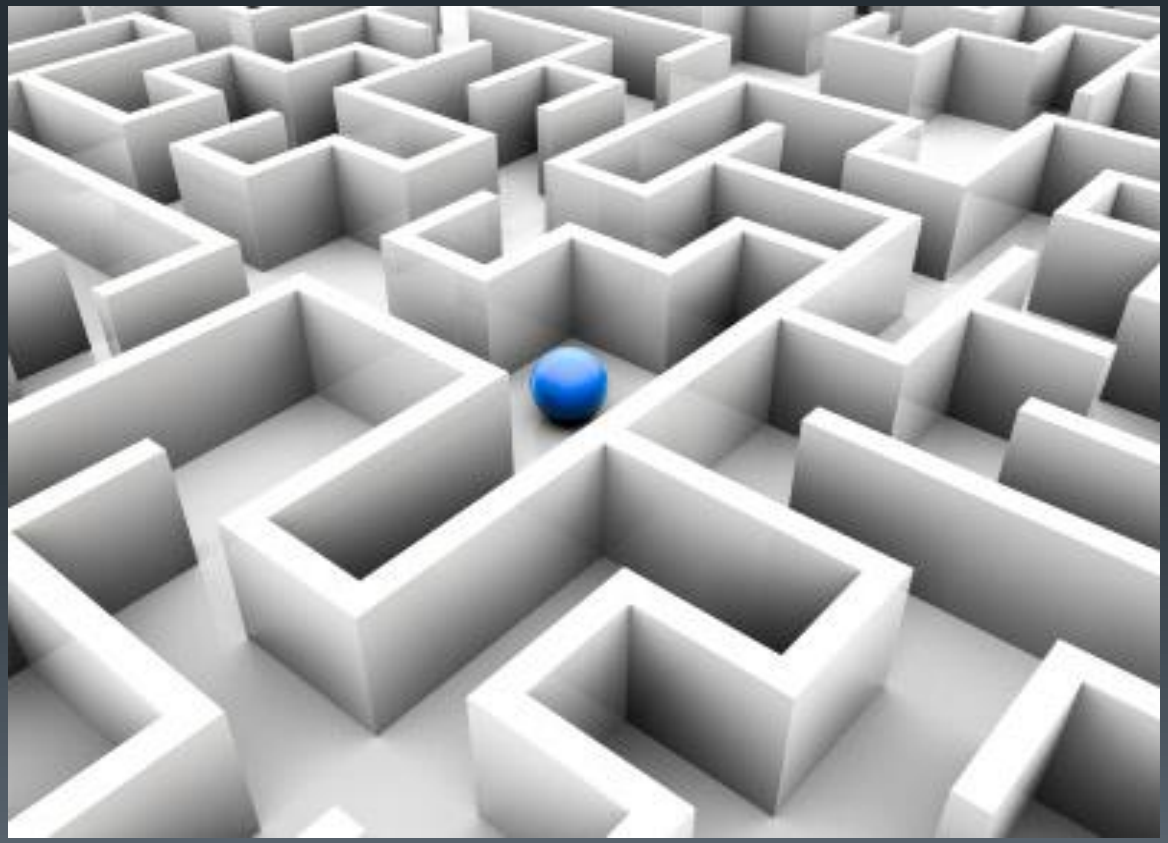
What happens?

Infection, malignancy or something else?

5th day

- Blood & urine culture – negative
- No improvements

What's next?



Because of the worsening of general condition, persistent increasing of the WBC and body temperature, mild diarrhea and no inflammatory disease detected we decided to test for Cl. Dificille (is a ’send-out’ test)

Treatment:

- Ciprofloxacin is discontinued
- Fluid management
- Metronidazole 1000mg 2 times per day IV

Enzyme immunoassay (EIA) test for Cl. difficile toxin A - positive

- The patient's condition gradually improved over a period of several days (with no diarrhea, vomiting or fever) and was discharged well.
- urea 5,3 mmol/L creatinine 0,8 mg/dL (normal range 0,7-1,3)

Day	WBC	BT
6	18,2	38,0
7	14,7	37,4
8	8,4	36,6
9	9,0	36,6
10	7,8	36,6
11	7,6	36,6

Risk Factors for Initial CDI

Classic risk factors:

- **Antibiotic therapy (Clindamycin, Ampicillin, Amoxicillin, Cephalosporins, Fluoroquinolones)**
- **Advanced age**
- **Prolonged stay in healthcare facility**
- **High severity of illness**
- **Diabetes mellitus**

Additional risk factors

- **Inflammatory bowel disease**
- **Gastrointestinal surgery**
- **Gastric acid suppression (PPIs)**
- **Immunosuppression**

1. APIC. *Guide to the Elimination of Clostridium difficile in Healthcare Settings*. November 2008.
2. Cohen SH, et al. *Infection Control and Hospital Epidemiology.* 2010;31(5):431-455.

SHEA/IDSA Treatment Recommendations

Clinical scenario	Supportive clinical data	Recommended treatment
Mild to moderate	Leukocytosis (WBC < 15,000 cells/uL) or SCr level < 1.5 times premorbid level	Metronidazole 500 mg 3 times per day PO for 10-14 days
Severe	Leukocytosis (WBC ≥ 15,000 cells/uL) or SCr level ≥ 1.5 times premorbid level	Vancomycin 125 mg 4 times per day PO for 10-14 days
Severe, complicated	Hypotension or shock, ileus, megacolon	Vancomycin 500 mg 4 times per day PO or by nasogastric tube *plus* metronidazole 500 mg IV q 8 hrs

Cohen SH, et al. *Infect Control Hosp Epidemiol.* 2010;31(5):431-455.

Summary

Unexplained leukocytosis in hospitalized patients should prompt a search for symptoms and signs consistent with Cl. difficile infection and a study to detect Cl. difficile.

To do, or not to do?

Empiric therapy

Usually saves lives, but sometimes…